

Overview of dietary validation studies in relation to the 24-hour recall

by

Welch Ailsa A¹

Dietary assessment methods are used for a number of reasons from individual assessments in clinical situations to epidemiological studies and monitoring the impact of public health interventions, to developing dietary guidelines and health policy^{1,2}. Although a number of dietary methods exist, ranging from open-ended weighed records and food records, to list-based methods such as Food Frequency Questionnaires, the 24-hour recall method exhibits some advantages in terms of low investigator and respondent burden^{1,3}. Twenty-four hour recalls can be either self-reported or interviewer administered, either face-to face or via telephone communication, or more recently by programmes accessible via the internet. The data can be recorded either on paper or by using computer software.

Although the aim of performing dietary assessments is to capture precise and accurate data, measurement error can occur for a number of reasons including interviewer bias, respondent bias, reporting errors and omissions, and methodological issues during entry and processing of data. The effects of measurement error lead to bias and inconsistency in diet exposure-disease association studies and probable attenuation of the findings, although in inflation of findings is also possible³. Despite the strengths of 24-hour recalls, single days do not accurately reflect habitual dietary intake of episodically eaten foods. However, this problem can be overcome, to an extent, by repeated administration of 24-hour recalls.

There are five main methods of identifying and quantifying measurement error 1) Comparison with other dietary methods (relative validity) 2) Use of predictor reference methods or cut-points eg Goldberg equations for identification of mis-reporting 3) Biomarkers: *quantitative recovery biomarkers* or *concentration biomarkers* 4) Comparison with disease risk biomarkers eg saturated fat and LDL cholesterol 5) Comparative prediction of disease risk eg breast cancer risk and saturated fat intake. However, since person-specific reporting bias means that within person measurement errors are correlated, use of biomarkers (that have independent error structures) is preferable to using dietary methods for validation^{4,5}.

My talk will review measurement error related issues with 24-hour recall methodology and what we can learn from using biomarkers to estimate measurement error in this context.

¹ University of East Anglia, School of Medicine, Diet and Health Group, Norwich, United Kingdom
a.welch@uea.ac.uk

References

1. Welch A.A. . Encyclopedia of Human Nutrition, second edition. Oxford: Elsevier Ltd 2005:7-15
2. Gibson RS. Principles of Nutritional Assessment. Oxford University Press 2005
3. Schatzkin A, Subar AF, et al Observational epidemiologic studies of nutrition and cancer: the next generation (with better observation). Cancer Epidemiol Biomarkers Prev. 2009 Apr;18(4):1026-32
4. Black AE, Cole TJ. J Am Diet Assoc. 2001 Jan;101(1):70-80
5. Kipnis V, Subar AF, et al. Am J Epidemiol. 2003 Jul 1;158(1):14-21